

WHAT IS CLAIMED IS:

1. An intervertebral disk prosthesis suitable for being put into place between two vertebrae by the posterior technique or by the anterior technique, the prosthesis comprising:

· a first fixing element having both an anchoring first face for anchoring in one of the vertebrae and a co-operation second face;

· a second fixing element having both an anchoring first face for anchoring in the other vertebrae and a co-operation second face;

· a first prosthesis element having both an active first face and a co-operation second face, said co-operation faces of the first fixing element and of the first prosthesis element serving to fasten the two elements together in a plane substantially orthogonal to the axis of the vertebrae;

· a second prosthesis element having both an active first face and a co-operation second face, said co-operation faces of the second fixing element and of the second prosthesis element serving to fasten the two elements together in a plane substantially orthogonal to the axis of the vertebrae; and

· each of said active faces of the prosthesis elements defining at least a portion of a spherical cap that is respectively concave or convex, said spherical cap portions co-operating with one another.

2. An intervertebral disk prosthesis according to claim

1, in which each prosthesis element comprises two distinct parts, each active face of one of said parts defining a spherical cap portion such that the spherical cap portions belonging to the same prosthesis element are disposed on the same spherical surface when the two parts are fixed to the vertebrae by said fixing elements.

3. An intervertebral disk prosthesis according to claim 1, in which each prosthesis element is constituted by a single part whose active face is constituted by a substantially plane surface in which a single spherical cap is formed, said spherical caps being respectively concave and convex.

4. An intervertebral disk prosthesis suitable for being put into place between two vertebrae by the anterior technique or the posterior technique, the prosthesis comprising:

- two prosthesis elements, each prosthesis element comprising two distinct parts, each part presenting both a first face for fixing to a vertebra and an active second face in the form of a portion of a spherical cap;

- the spherical cap portions forming the active faces of the two parts belonging to the same prosthesis element being disposed on the same spherical surface when said parts are fixed to the vertebra.

5. An intervertebral disk prosthesis according to claim 4, further comprising first and second fixing elements that are distinct from said parts forming the prosthesis elements, each fixing element presenting an anchoring first face for anchoring in one of the vertebrae and a co-operation face suitable for co-operating with the first faces of two parts forming a prosthesis element so as to secure said parts to said fixing element in a plane that is substantially orthogonal to the axis of the vertebrae.

6. An intervertebral disk prosthesis according to claim 1, in which the two spherical caps are of distinct radii of curvature.

7. A prosthesis according to claim 1, in which the anchoring face of each fixing element is provided with at

least one rib projecting from said face and suitable for co-operating with a groove formed in the corresponding vertebra.

- 5 8. A prosthesis according to claim 1, in which the anchoring face of each fixing element is provided with a plurality of studs projecting from said face and suitable for co-operating with orifices pierced in the corresponding vertebra.
- 10 9. A prosthesis according to claim 1, in which the fixing face of each fixing element includes at least one portion in relief projecting from said face and suitable for co-operating with at least one recess formed in the
- 15 corresponding vertebra.
10. A prosthesis according to claim 1, in which the co-operation face of a fixing element or of a prosthesis element is provided with a locking member projecting from
- 20 said surface, in which the other co-operation surface is provided with a hollow locking member suitable for co-operating with the projecting locking member, and in which said hollow locking member opens out into the periphery of the corresponding co-operation surface in
- 25 such a manner that the projecting locking member can be engaged in the hollow locking member by movement in translation in a plane parallel to the planes of the co-operation surfaces.
- 30 11. A prosthesis according to claim 2, in which, when the active surfaces of the parts of the first prosthesis elements are totally facing the active surfaces of the parts of the second prosthesis elements, the co-operation surfaces of the parts forming the first prosthesis
- 35 element are situated in a first plane which forms a dihedral angle with the plane in which the co-operation surfaces of the parts forming the second prosthesis

elements are situated, thereby enabling the prosthesis to be correct a tendency to scoliosis.

12. A prosthesis according to claim 1, in which the co-operation faces of the fixing elements are provided with projecting locking members for fastening them to the prosthesis elements, said locking members of one of the fixing elements being offset relative to the locking members of the other fixing elements so that the two fixing elements can be inserted between the vertebrae pressed one against the other.

13. A prosthesis according to claim 1, in which each anchoring face of each fixing element includes a member for anchoring in the vertebra constituted by two right-angle triangles touching via one of their short sides, the two triangles not being in alignment.

14. An intervertebral disk prosthesis according to claim 5, in which the two spherical caps are of distinct radii of curvature.

15. A prosthesis according to claim 5, in which the co-operation face of a fixing element or of a prosthesis element is provided with a locking member projecting from said surface, in which the other co-operation surface is provided with a hollow locking member suitable for co-operating with the projecting locking member, and in which said hollow locking member opens out into the periphery of the corresponding co-operation surface in such a manner that the projecting locking member can be engaged in the hollow locking member by movement in translation in a plane parallel to the planes of the co-operation surfaces.

16. A prosthesis according to claim 4, in which, when the active surfaces of the parts of the first prosthesis

elements are totally facing the active surfaces of the parts of the second prosthesis elements, the co-operation surfaces of the parts forming the first prosthesis element are situated in a first plane which forms a
 5 dihedral angle with the plane in which the co-operation surfaces of the parts forming the second prosthesis elements are situated, thereby enabling the prosthesis to be correct a tendency to scoliosis.

10 17. A prosthesis according to claim 4, in which the co-operation faces of the fixing elements are provided with projecting locking members for fastening them to the prosthesis elements, said locking members of one of the fixing elements being offset relative to the locking
 15 members of the other fixing elements so that the two fixing elements can be inserted between the vertebrae pressed one against the other.

20 18. A prosthesis according to claim 4, in which each anchoring face of each fixing element includes a member for anchoring in the vertebra constituted by two right-angle triangles touching via one of their short sides, the two triangles not being in alignment.

25 19. A method of implanting an intervertebral disk prosthesis by the posterior technique, the prosthesis comprising:

- a first fixing element having both an anchoring first face for anchoring in one of the vertebrae and a
 30 co-operation second face;
- a second fixing element having both an anchoring first face for anchoring in the other vertebrae and a co-operation second face;
- a first prosthesis element having both an active
 35 first face and a co-operation second face, said co-operation faces of the first fixing element and of the first prosthesis element serving to fasten the two

elements together in a plane substantially orthogonal to the axis of the vertebrae;

· a second prosthesis element having both an active first face and a co-operation second face, said co-operation faces of the second fixing element and of the second prosthesis element serving to fasten the two elements together in a plane substantially orthogonal to the axis of the vertebrae; and

· each of said active faces of the prosthesis elements defining at least a portion of a spherical cap that is respectively concave or convex, said spherical cap portions co-operating with one another;

said method comprising the steps consisting in:

· providing a posterior access to the intervertebral plate into which said prosthesis is to be implanted;

· moving apart the two vertebrae defining said space;

· removing the natural intervertebral disk; and

· implanting said prosthesis between the vertebrae by performing the following steps:

a) inserting at least one fixing element between the vertebrae round one side of the dura mater;

b) causing said fixing element to turn so as to place it beyond the dura mater in its anchoring location;

c) anchoring said fixing element in the vertebra;

d) when necessary, repeating steps a), b), and c) for the second fixing element;

e) introducing the prosthesis elements round at least one side of the dura mater; and

f) causing each prosthesis element to co-operate with a fixing element.

20. A method according to claim 19, in which, prior to the step of implanting the prosthesis, anchoring resections are formed in the vertebrae.

21. A method according to claim 19, in which the two fixing elements are implanted simultaneously.

22. A method according to claim 19, in which each
5 prosthesis element is constituted by two distinct parts, and for each prosthesis element, a first part is inserted round a first side of the dura mater and the second part is inserted round the other side of the dura mater.

10 23. A method of implanting an intervertebral disk prosthesis by the anterior technique, the prosthesis comprising:

· a first fixing element having both an anchoring first face for anchoring in one of the vertebrae and a
15 co-operation second face;

· a second fixing element having both an anchoring first face for anchoring in the other vertebrae and a co-operation second face;

· a first prosthesis element having both an active
20 first face and a co-operation second face, said co-operation faces of the first fixing element and of the first prosthesis element serving to fasten the two elements together in a plane substantially orthogonal to the axis of the vertebrae;

25 · a second prosthesis element having both an active first face and a co-operation second face, said co-operation faces of the second fixing element and of the second prosthesis element serving to fasten the two elements together in a plane substantially orthogonal to
30 the axis of the vertebrae; and

· each of said active faces of the prosthesis elements defining at least a portion of a spherical cap that is respectively concave or convex, said spherical cap portions co-operating with one another;

35 the method comprising the steps of:

· providing an anterior access to the intervertebral plate into which said prosthesis is to be implanted;

- moving apart the two vertebrae defining said space;
- removing the natural intervertebral disk; and
- implanting said prosthesis between the vertebrae

5 by performing the following steps:

a) inserting at least one fixing element between the vertebrae;

b) anchoring said fixing element in the vertebra;

c) when necessary, repeating steps a) and b) for the
10 second fixing element;

d) inserting the prosthesis elements between the vertebrae; and

e) causing each prosthesis element to co-operate with a fixing element.

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24. A method according to claim 23, in which, prior to the step of implanting the prosthesis, anchoring resections are formed in the vertebrae.

20 25. A method according to claim 23, in which the two fixing elements are implanted simultaneously.